

**G. Fred Lee & Associates**

27298 E. El Macero Dr.  
El Macero, California 95618-1005  
Tel. (916) 753-9630 • Fax (916) 753-9956  
e-mail gfredlee@aol.com

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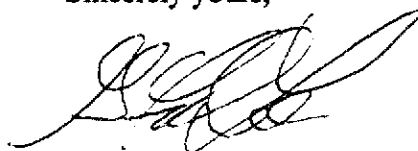
July 28, 1997

Kate Hansel  
CALFED Bay-Delta Program  
1416 Ninth Street, Suite 1155  
Sacramento, CA 95814

Dear Ms. Hansel,

Please find enclosed 10 copies of the proposal, "Development of a CALFED Management Program for Controlling Urban Area and Industrial Stormwater Runoff Pollutants" for CALFED-Category III support. I believe this proposal conforms to CALFED RFP requirements. If there are questions regarding this proposal, please contact me.

Sincerely yours,



G. Fred Lee, PhD, DEE

GFL:  
Enclosures

97 JUL 28 PM 3:21  
DWR WAREHOUSE

97 JUL 29 PM 3:22

**Development of a CALFED Management Program for Controlling  
Urban Area and Industrial Stormwater Runoff Pollutants that Impact  
Delta Water Quality and Aquatic Resources**

Submitted by  
G. Fred Lee, PhD, DEE  
G. Fred Lee & Associates

**The Problem** - Urban and industrial stormwater runoff contains a variety of chemical constituents and pathogenic organisms that represent a threat to the beneficial uses of the waterbodies receiving the runoff. In 1990, the US EPA adopted regulations which require that communities with populations greater than 100,000 must obtain an NPDES permit covering the stormwater runoff discharges to waterbodies. Under this permit system, regulated communities must control pollution of waters by stormwater runoff derived constituents to the **maximum extent practicable using best management practices**. Pollution is defined in the Clean Water Act as an impairment of the beneficial uses of a waterbody which includes adverse ecological impacts. This approach represents a significantly different approach than has and continues to be used for regulating NPDES permitted municipal and industrial wastewater discharges. Those discharges must not cause a violation of ambient water quality objectives in the receiving waters for the discharge.

The different approach used for urban stormwater runoff (USR) control is justified based on the finding that regulating USR using the same approach as wastewater discharges would cost the regulated urban dwellers from one to two dollars per person per day for construction, operation, and maintenance of the large treatment works that would be needed to treat USR so that there would be no exceedances of water quality standards (objectives) in the receiving waters for the runoff. Additional justification for regulating USR differently than municipal wastewater discharges stems from the nature of the stormwater runoff associated constituents and the duration of exposure that aquatic organisms present in the receiving waters for the stormwater runoff could receive during a runoff event. Many of the heavy metals and other constituents in USR have been found to be in non-toxic, non-available particulate forms, and therefore have no impact on receiving water beneficial uses. Further, the durations of exposure for organisms near the point of stormwater discharge are typically significantly less than those that are needed to adversely impact the organism.

Since the USEPA's development of the USR water quality management program, there have been large amounts of data developed across the country which have led to a number of important conclusions. These include:

- finding that exceedance of a water quality standard in USR at the point of runoff rarely translates to real pollution - impairment of use - of the receiving waters for the USR
- conventional end-of-the-pipe, edge of the pavement USR monitoring provides limited information on real water quality impacts of runoff associated constituents
- rarely will USR regulated constituents such as heavy metals cause pollution - use impairment of the receiving waters for the runoff

- unregulated constituents in USR, such as organophosphate pesticides used for residential pest management, cause stormwater runoff to be toxic at the point of runoff and may, therefore, be adverse to aquatic life-related beneficial uses of receiving waters for the runoff

CALFED has determined as one of its priority areas for 1997 category III funding *"inventory urban stormwater drains, establish the ecosystem significance of nutrients, salinity, turbidity, oxygen demand, and metals in runoff. Undertake actions as appropriate to prevent, treat, or otherwise reduce impacts including education, etc."* The implementation of CALFED's USR program will require the development of a highly sophisticated technical program to determine what, if any, regulated as well as unregulated USR to the Sacramento/San Joaquin River systems and the Delta are causing real **pollution** of receiving water beneficial uses that impair the aquatic resources of the Delta.

**Approach** - Dr. G. Fred Lee will serve as a consultant to CALFED management, formulating a USR water quality management strategy. This strategy will provide the technical basis for CALFED's urban and industrial stormwater runoff water quality management program. The funding of this proposal will provide Dr. Lee with the resources necessary to spend additional time on these issues beyond his already voluntary contribution of time and resources to formulation of a urban stormwater runoff water quality management program (USRWQMP). Dr. Lee has published extensively on the problems with current USRWQMP and has developed an alternative approach (Evaluation Monitoring - EM) that is specifically designed to determine the real water quality use impacts of USR associated constituents on the beneficial uses of receiving waters. Funding this proposal will enable Dr. Lee to work with CALFED management, regulatory agencies, and others as appropriate to develop and apply the EM approach for defining the water quality/ecological significance of USR associated constituents on Delta related aquatic resources.

**Budget** - The first year of this three year project has a proposed budget of \$69,550.00. The funds will be devoted to the support of Dr. Lee's time, serving as an advisor to CALFED as a consultant on the formulation and implementation of an USRWQMP.

**Qualifications** - For a 30 year period, until 1989, Dr. Lee taught graduate environmental engineering and environmental science courses at several major US universities. During this time, he conducted over five million dollars in research devoted to defining the sources, water quality and public health significance, and developing control programs for chemical constituents in aquatic systems. He has published over 650 papers and reports on his work. Since 1989, he has been a full-time consultant to governmental agencies and industry in the US and other countries in water supply water quality, water and waste water treatment, and water pollution control including urban stormwater water quality impact evaluation and management and Delta water quality issues.

**Monitoring and Coordination** - This project will formulate approaches for monitoring the efficacy of CALFED's USRWQMP. It will be coordinated with regulatory agencies, water quality researchers, and all other parties interested in managing water quality problems associated with USR that are of importance to the Delta and Upper Bay.

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Urban Area and Industrial Stormwater Runoff Pollutants that Impact  
Delta Water Quality and Aquatic Resources**

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G. Fred Lee, PhD, DEE  
G. Fred Lee & Associates  
27298 El Macero Drive  
El Macero, CA 95618  
Tel. (916) 753-9630 Fax (916) 753-9956  
e-mail [gfredlee@aol.com](mailto:gfredlee@aol.com)

G. Fred Lee & Associates is a Sole Proprietorship Environmental Consulting Firm

Tax I.D. Number 84-0812724

Contact Person: G. Fred Lee

Many individuals concerned with Delta water quality and aquatic resource  
management are anticipated to be participants in this project.

RFP Project Group Type: Other Services

## Project Description

### Background

In 1987, the federal Congress required that the US EPA develop an urban stormwater runoff water quality management program (USRWQMP). In 1990, the US EPA released its current USRWQMP. This program requires the control of **pollution - use impairment -** of the receiving waters for the stormwater runoff to the **maximum extent practicable using best management practices**. The US EPA is implementing its USRWQMP in a phase approach where Phase I requires that municipalities with populations greater than 100,000 obtain an NPDES permit for their stormwater runoff. Phase II, which will likely expand Phase I to cover communities greater than 50,000, is currently being formulated. The US EPA's approach for regulating urban stormwater runoff (USR) represents a significantly different approach than is being used for regulating NPDES permitted municipal and industrial wastewater discharges. Those discharges must not cause a violation of ambient water quality standards (objectives) in the receiving waters for the discharge.

The different approach used for USR control is justified based on the finding that regulating USR using the same approach as wastewater discharges would cost the regulated urban dwellers from one to two dollars per person per day for construction, operation, and maintenance of the large treatment works that would be needed to treat USR so that there are no exceedances of water quality standards (objectives) in the receiving waters for the runoff. Additional justification for regulating USR differently than municipal wastewater discharges stems from the chemical nature of the stormwater runoff-associated constituents and the duration of exposure that aquatic organisms present in the receiving waters for the stormwater runoff could receive during a runoff event. Many of the heavy metals and other constituents in USR have been found to be in non-toxic, non-available particulate forms, and therefore have no impact on receiving water beneficial uses. Further, the durations of exposure for organisms near the point of stormwater discharge are typically significantly less than those that are needed to adversely impact aquatic organisms. In addition, high concentrations of USR-associated constituents are typically diluted below critical levels in the receiving waters in a short period of time after discharge.

Since the US EPA's development of the USR water quality management program, there have been large amounts of data developed across the country which have led to a number of important conclusions. These include:

- finding that exceedance of a water quality standard in USR at the point of runoff rarely translates to real pollution - impairment of use - of the receiving waters for the USR
- conventional end-of-the-pipe, edge of the pavement USR monitoring provides limited information on real water quality impacts of runoff associated constituents
- rarely will USR-regulated constituents such as heavy metals cause pollution - use impairment of the receiving waters for the runoff
- unregulated constituents in USR, such as organophosphate pesticides used for residential pest management cause stormwater runoff to be toxic at the point of runoff and may, therefore, be adverse to aquatic life-related beneficial uses of receiving waters for the runoff

CALFED has determined as one of its priority areas for 1997 Category III funding "*inventory urban stormwater drains, establish the ecosystem significance of nutrients, salinity, turbidity, oxygen demand, and metals in runoff. Undertake actions as appropriate to prevent, treat, or otherwise reduce impacts including education, etc.*" The implementation of CALFED's USR management program in a technically valid, cost-effective manner will require the development of a current state of science and engineering technical program to determine what, if any, regulated as well as unregulated USR-associated constituents (i.e. nutrients, salinity, turbidity, oxygen demand, metals, toxicity, etc.) discharged to the Sacramento/San Joaquin River systems and the Delta are causing real **pollution** - use impairment of receiving water beneficial uses that are impairing the aquatic resources including all beneficial uses and ecosystem health of the Delta.

It is proposed that CALFED provide support for Dr. G. Fred Lee to work with the CALFED Water Quality Technical Group to develop and implement an approach for managing chemical constituents and pathogenic organism indicators present in urban and industrial stormwater runoff that are significantly adverse to the designated beneficial uses of the Sacramento /San Joaquin River Delta and its tributaries. Dr. Lee has approximately 30 years of professional experience in evaluating and managing urban area stormwater runoff water quality. He has pioneered the development of the Evaluation Monitoring approach for defining and managing real water quality use impairments arising from the input of chemical constituents and pathogenic organisms in USR.

He is currently providing technical leadership for a watershed-based water quality management program Evaluation Monitoring Demonstration Project in the Upper Newport Bay and lower Santa Ana River watersheds in Orange County, California. This demonstration project is a three year, \$150,000 effort devoted to demonstrating the use of Evaluation Monitoring for defining the water quality use impairments of Upper Newport Bay and its tributaries as well as the lower Santa Ana River that are caused by urban area and rural stormwater runoff associated constituents. During the first year of the Demonstration Project, high levels of aquatic life toxicity were found in stormwater runoff entering Upper Newport Bay that was due, at least in part, to the use of pesticides for urban pest control.

As of July 1, 1997, the Demonstration Project has been expanded to include support from US EPA 205j and 319h grants in the amount of several hundred thousand dollars over a two year period focusing on determining the water quality significance of urban stormwater runoff associated aquatic life toxicity in Upper Newport Bay. Further, this supplemental funding will be used through forensic studies to define the sources of the aquatic life toxicity that have been found in the stormwater runoff to the Bay. Dr. Lee is responsible for designing and implementing the studies being conducted in the Demonstration Project and through the 205j and 319h grants. His work on these projects is conducted in cooperation with the Santa Ana Regional Water Quality Control Board, several Orange County agencies concerned with stormwater runoff water quality management, as well as other stakeholders concerned with Upper Newport Bay water quality.

The Upper Newport Bay studies that are being conducted under Dr. Lee's leadership will provide large amounts of technical information that has direct applicability to the evaluation and

management of urban and industrial stormwater runoff in the Delta watershed as it may impact Delta aquatic resources. The results of these studies through support of this project will provide invaluable guidance to CALFED in formulating and implementing a technically valid, cost-effective urban and industrial stormwater runoff water quality management program.

With support of this proposed project, Dr. Lee will work with CALFED management and others as appropriate to apply the Evaluation Monitoring approach to defining the real water quality use impairments of Delta waters and aquatic resources that are caused by constituents in urban and industrial stormwater runoff. This effort will lead to the development of a stakeholder watershed-based water quality management program designed to control real water quality problems in the Delta watershed arising from urban and industrial stormwater runoff in accord with current regulatory requirements of controlling pollution to the maximum extent practicable using best management practices.

## **Approach**

The approach that would be followed in this project will be patterned after the Evaluation Monitoring approach that is being used by Dr. Lee in the Evaluation Monitoring Demonstration Project that is currently underway in Orange County, California. The Evaluation Monitoring approach was originally developed by Drs. G. Fred Lee and Anne Jones-Lee as an alternative to the conventional stormwater runoff monitoring and best management practices (BMP) development approaches. It is widely recognized that the conventional urban stormwater runoff monitoring and BMP development has highly significant technical deficiencies which can cause the waste of large amounts of private and public funds in implementing unnecessary stormwater runoff constituent control programs that do not address real water quality problems of concern to the public.

The Evaluation Monitoring approach is a true watershed-based water quality evaluation and management program that specifically focuses on the following:

- finding real, significant water quality use impairments for the waterbodies of concern
- determining the cause of these impairments, i.e. the chemical constituents and/or pathogenic or other organisms responsible for the use impairment
- through forensic analysis, determining the source of the specific constituents responsible for the use impairment
- for urban stormwater runoff derived constituents, controlling the constituents (true pollutants) responsible for the use impairment at their source using BMPs to the maximum extent practicable (MEP).

A clear distinction is made in the Evaluation Monitoring approach between chemical constituents in a waterbody irrespective of their impact on water quality, such as total copper, total lead, total mercury, etc., and the toxic available forms of the heavy metals and other constituents that cause the water quality use impairment, i.e. real pollution. Evaluation Monitoring also recognizes that some of the current regulatory approaches for control of water pollution tend to significantly overestimate the water quality use impairments that are due to the regulated constituents, such as heavy metals (i.e. those for which there are water quality criteria), and the vast arena of unregulated or under-regulated

constituents, such as many of the organophosphate pesticides which have been found to cause significant aquatic life toxicity in waters in California and other parts of the U.S.

Drs. G. Fred Lee and Anne Jones-Lee have published extensively on the need for, development of and implementation of Evaluation Monitoring programs. Their publications include a recently developed, 100+ page guidance document devoted to the development and implementation of Evaluation Monitoring programs for urban area stormwater runoff water quality impact assessment and management. Additional information on Evaluation Monitoring is available in several papers and reports that are listed and made available as downloadable files from Dr. Lee's web site (<http://members.aol.com/gfredlee/gfl.htm>).

The basic question that would be addressed by Dr. Lee in this project is what, if any, information exists now that suggests a potential water quality/use impairment within the Delta that is due to USR discharged directly into the Delta or upstream within the watershed. Dr. Lee will define the information gaps that exist in answering this question and will provide guidance on the information needed through site specific studies to provide definitive information. Further, during the latter part of the first year and the following two years, Dr. Lee will work with CALFED management to find investigators who could conduct the necessary studies.

Particular attention will be given to assessing whether USR from the larger metropolitan areas, such as Stockton and Sacramento, are contributing pollutants to the receiving waters that impair the beneficial uses of these waters in the vicinity of the discharge. Each of these areas will be evaluated with respect to the potential for USR to contribute constituents in sufficient concentrations of toxic available forms for a sufficient duration to be adverse to local aquatic life in the vicinity of the runoff. For those situations where there is a significant potential for such adverse impacts, an evaluation would be made as to whether the potential impacts could impair Delta water quality and aquatic resources. For example, could urban stormwater runoff in headwater areas for tributaries of the Delta be adverse to migratory fish populations that are of importance as a Delta aquatic resource through impairment of fish reproduction?

Support of this project will not involve specific field studies of actual impacts associated with USR, but will provide the information needed to develop guidance on how to make such evaluations and where within the Sacramento/San Joaquin River and Delta systems should such site specific investigations be conducted. Further, specific guidance will be provided on how the study should be conducted to develop the information needed by CALFED and others to formulate and implement a technically valid, cost-effective urban and industrial stormwater runoff water quality management program.

With respect to industrial stormwater impact and management issues, Dr. Lee, as part of this project, will review CVRWQCB industrial stormwater monitoring records and information to select the industrial sites in the Delta and its watershed where there is a potential water quality problem associated with stormwater runoff. If this review shows there is inadequate information being provided in the current NPDES permit required monitoring, then suggestions will be made to

CALFED and to CVRWQCB on the additional monitoring that should be conducted to better define whether there is a potentially significant water quality problem associated with industrial stormwater runoff. Of particular concern is monitoring the runoff and receiving waters for aquatic life toxicity and excessive bioaccumulation of hazardous chemicals from those areas in the Delta watershed where toxic chemicals are used, disposed of or could likely be present in stormwater runoff. Dr. Lee has recently completed a paper assessing how stormwater runoff from such areas should be evaluated; this report is available on his web site.

### **Project Location**

The primary area of focus in this project is the Delta where USR derived from urban areas within the Delta and upstream could be adverse to Delta water quality and/or its aquatic life.

The second location where the project activities will be focused is the areas near where urban and industrial stormwater runoff enters the Sacramento/San Joaquin River system, including their tributaries. Those areas in the Delta watershed that are important spawning areas for fish that represent aquatic resources in the Delta will be specifically evaluated to determine if there is a significant potential for USR to cause water quality/ecological impairments in the ecologically sensitive areas of the Delta watershed.

This proposal is an outgrowth of the work that Dr. Lee has been doing in connection with the Sacramento River Watershed Toxics Control Program. Beginning in the spring of 1996, with the initiation of this program, Dr. Lee, without support or affiliation with any particular group, because of his interest in seeing that up-to-date science and engineering is used in water quality management, has been an active participant in the Sacramento River Watershed Toxics Control Program. This participation has included attending many of the meetings for both the Toxics and the Monitoring Subcommittees. He has provided extensive written comments on issues that need to be considered as part of developing a technically valid, cost-effective "toxics" control program for the Sacramento River system (including the Delta) downstream water users and San Francisco Bay.

In January 1997, Dr. Lee proposed an alternative Phase I monitoring program to the Monitoring Subcommittee for the Sacramento River Watershed Program that was based on using the Evaluation Monitoring approach to begin to define the real water quality problems in the Sacramento River system. The EM approach proposed by Dr. Lee was adopted as the basic framework for initiating the Sacramento River Watershed Management Program that is being conducted by the CVRWQCB. The Phase I monitoring involves a \$0.5 million, one year effort of special purpose data collection that includes the measurement of key water quality parameters that provide information on whether constituents added to the Sacramento River system are causing an adverse impact of the beneficial uses of this system, including the Delta.

The funding of this proposal would enable Dr. Lee to expand the work that has already been initiated in the Sacramento River Watershed Program to specifically address the development of the information needed to define on a site specific basis whether urban or industrial stormwater runoff-

associated constituents are likely to adversely impact the beneficial uses of the Delta and its aquatic resources. Dr. Lee would make extensive use of the Sacramento River Phase I monitoring program results during the second and third years of the proposed project to further refine the CALFED USRWQMP.

### **Expected Benefits and Need for Project**

The primary benefits from this project will be the development and implementation of a technically valid, cost-effective CALFED urban and industrial stormwater runoff water quality management program that will control USR-derived pollutant inputs to Delta tributaries and the Delta that lead to water quality and ecosystem impairment. This project will provide the technical information base upon which CALFED can formulate its USR water quality management program.

### **Proposed Scope of Work**

The funds derived from this project will enable Dr. G. Fred Lee to significantly expand his current informal voluntary technical assistance in formulating a technically valid, cost-effective urban stormwater runoff water quality management program for the Sacramento River watershed. Dr. Lee will be an organizer and synthesizer of technical information for CALFED on technical issues that should be incorporated into the CALFED USRWQMP. Because of his technical expertise and experience, with CALFED's financial support for this project he will develop draft issue papers pertinent to formulating the CALFED USRWQMP. These issue papers will first be reviewed by knowledgeable, interested parties and after redrafting, will be circulated to anyone interested in the current Delta USR problem and/or its management for their review and comment.

Dr. Lee will organize workshops which will provide an opportunity for interested parties to become familiar with Evaluation Monitoring, its application to Delta water quality/aquatic resource management, and the specific approaches that Dr. Lee proposes to follow in helping CALFED formulate and implement a technically valid, cost-effective CALFED USRWQMP. Associated with each of the issue papers will be a workshop to present and review the final draft of the issue paper. Based on comments received at the workshop, the final version of the issue paper will be developed and distributed to interested parties.

The first of the issue papers will be a synthesis of what is known about developing a technically valid, cost-effective USRWQMP for the Delta and its tributaries. This issue paper will also discuss the major data gaps that need to be addressed and how they should be addressed by site specific studies. The issue paper will develop consensus statements on issues where the strengths and weaknesses of any particular position that is important to formulating a CALFED USRWQMP is fully discussed. It will be Dr. Lee's intent to organize periodic meetings for all interested parties in the development of the CALFED USRWQMP and its implementation.

It is anticipated that the first draft of the initial issue paper will be completed within four to six months. It will serve as a guide to CALFED on how to allocate resources for developing and

implementing a USRWQMP. As new information becomes available from the literature or from site specific studies, some of which will likely be funded by CALFED, Dr. Lee will update his consensus statement on how CALFED should develop and implement a USRWQMP.

Dr. Lee plans to meet with CALFED water quality management on at least monthly intervals and will provide summary reports on activities for each month.

During the first year, CALFED will have available a USR management guideline for developing and implementing a USRWQMP. Initial steps toward its implementation could begin during this period. Based on the current understanding of issues, some of the key components of the USR management program will not be able to be formulated until site specific studies have been completed. This project will develop a consensus on these specific components with respect to what needs to be done and how this information will be used in the CALFED USR management program.

By mid-second year, several of the CALFED projects, as well as projects supported by other sources, should begin to release results that can be incorporated into refining the CALFED USRWQMP. It will be Dr. Lee's responsibility to develop a review evaluating the adequacy of new information obtained from the literature and from CALFED-sponsored research pertinent to the development and implementation of the USRWQMP. Dr. Lee will incorporate the new information as it becomes available into the revised program document. He plans to meet with all interested parties at least quarterly to review new developments and refinements of the CALFED USRMP.

### **Monitoring and Data Evaluation**

During the latter part of the first year, and especially during the second year, Dr. Lee will be developing a guideline for monitoring the impacts of USRWQMP that can be used at site specific locations to establish the cost-effectiveness of USR control programs. The monitoring programs will cover special purpose studies that can provide early indications of ineffective and effective control strategies. The issues raised in the recently released Draft Framework for the CALFED Research Plan will be incorporated into monitoring this program where details on how this framework should be implemented in USR management programs are presented.

### **Implementability**

The Evaluation Monitoring approach has been extensively reviewed by a number of regulatory agencies and has been found to be a technically valid, cost-effective approach for implementing USR management programs. It is fully compatible with, and strongly supports, the US EPA and State of California WRCB guidelines for managing USR-caused water pollution.

## **Costs and Schedule**

### **Budget**

The proposed budget for the first year of this project is presented in Table 1. The project can be implemented as soon as funds are made available. The anticipated funding levels for the second and third years are the same as for the first. As indicated in Table 1, the CALFED funds will be used to support Dr. Lee's activities presented in the Scope of Work in which he serves as a technical resource and high level technical expertise facilitator and synthesizer of information from the literature and recent and ongoing studies that can be used to formulate a CALFED urban stormwater runoff water quality management program that will protect and, where degraded, enhance the Delta's aquatic resources without unnecessary expenditures for chemical constituent and pathogenic organism control.

### **Discussion of Budget**

Dr. Lee proposes to spend an average of one ten-hour day per week devoted to CALFED WQTG urban and industrial stormwater runoff water quality management program development and implementation during the first year of the project. He has proposed to adjust his normal consulting rate from the current \$225 per hour to \$100 per hour for this project. He will, therefore, donate \$65,000 in support of CALFED WQTG activities during the course of this project. This will be Dr. Lee's cost-share contribution for the project. Actually, Dr. Lee's cost-share contribution for the project will likely be greater than this amount, as a result of his donating time needed to accomplish the goals of the project beyond that for which he is compensated by project funds.

The billing rates for Dr. Lee are rates which include his total costs except for project employees, supplies, and travel. There are no overhead/indirect costs, multipliers, fees or separate profit items associated with these rates. Since this is basically a consulting contract, which provides funds to enable Dr. Lee to serve as a consultant to CALFED, this budgeting approach is appropriate for this project. It is the same budgeting approach that Dr. Lee has been using with governmental agencies, industry and others, in similar types of consulting activities over the past 30 years.

While no funds are budgeted for the support of Dr. Anne Jones-Lee (Dr. G. Fred Lee's wife), she will, as needed, be an active participant in the project. Her activities will be primarily focused on providing advice on the aquatic biology/aquatic toxicology components of the project, as well as in the project report preparation. She will donate her time on behalf of the project as needed.

While the focus of Dr. Lee's activities will be the development of a technically valid, cost-effective urban and industrial stormwater runoff water quality management program for the Delta and its watershed, Dr. Lee will be available to CALFED as an advisor on other aspects of the CALFED water quality management program.

### **Schedule Milestones**

The anticipated milestones for this activity have been presented and discussed under **Scope of Work**.

There are no third party impacts from this project that would require mitigation.

Table 1

**Budget**  
**Year One of a Three Year Project**

Budget period is one year.  
The project can be initiated upon award of contract.

**Personnel:**

Dr. G. Fred Lee, PhD, DEE	
10 hrs/week for one year @ \$100/hr.	\$52,000.00
Hourly help	
500 hrs @ \$18/hr.	9,000.00
Secretarial	
250 hrs @ \$15/hr.	<u>3,750.00</u>
Total Personnel	\$64,750.00

**Expenses**

Travel: Miscellaneous travel Sacramento region	300.00
Telephone/Fax/Photocopies	4,500.00
Total Travel and Supplies	<u>\$4,800.00</u>

**Total Budget:** **\$69,550.00**

The anticipated budgets for the second and third year of this project are expected to be approximately the same as the first year's budget.

## Qualifications

Dr. Lee has a PhD degree from Harvard University obtained in 1960 with an emphasis in environmental engineering, environmental sciences, and aquatic chemistry/water quality. He obtained a Master's degree in Public Health in 1957 from the University of North Carolina. For a 30 year period, until 1989, Dr. Lee taught graduate environmental engineering and environmental science courses at several major US universities. During this time, he conducted over five million dollars in research devoted to defining the sources, water quality, and public health significance of chemical constituents in aquatic systems, as well as developing control programs for them. He has published over 650 papers and reports on his work.

Since 1989, he has been a full-time consultant to governmental agencies and industry in the US and other countries in water supply water quality, water and wastewater treatment, water pollution control including urban stormwater runoff water quality management and Delta water quality issues, and solid and hazardous waste management.

Beginning in the mid 1960's, Dr. G. Fred Lee, through the International Biological Program, initiated the first comprehensive research program designed to evaluate the potential water quality significance of urban stormwater runoff-associated chemical constituents. This work was done at the University of Wisconsin, Madison, by Dr. Lee and his graduate students. They established, for the first time, quantitative loads of selected chemical constituents in Madison's USR. They also examined the impact of this USR in several of Madison's urban lakes. They found, through the use of toxicity and bioavailability tests, that substantial parts of the nutrients and heavy metals were in non-toxic, non-available forms. Dr. Lee and his graduate students expanded this work to other parts of the US to include Rochester, NY, and Dallas, TX.

During the late 1970's and early 1980's, the US EPA initiated the National Urban Runoff Program (NURP) through which the agency funded studies on the bulk chemical characteristics of USR in various parts of the US. At that time, Dr. Lee was involved as an advisor to the city of Fort Collins, CO and the City and County of Denver on their respective USR studies. While the NURP studies confirmed what had been found previously, that USR contains elevated concentrations of heavy metals, nutrients, and a number of other constituents that could be adverse to receiving water beneficial uses, including aquatic ecosystems, the US EPA NURP studies did not investigate the impact of the USR-associated constituents on the beneficial uses of the receiving waters for the USR.

Dr. Lee has been and continues to be an active participant in the State of California's Water Resources Control Board Urban Stormwater Runoff Task Force. This Task Force is composed of individuals interested in urban stormwater runoff water quality management from dischargers, regulators and environmental groups' perspectives. The Task Force has been highly successful in developing consensus approaches and regulatory requirements for managing urban area and industrial stormwater runoff water quality problems without significant, unnecessary expenditures for chemical constituent control. Dr. Lee will be able to bring to CALFED, Task Force activities that

are pertinent to CALFED's urban and industrial stormwater runoff water quality management program.

A key component of this proposed project is the development of a number of issue papers which represent consensus discussions pertinent to providing guidance on the development and implementation of the CALFED urban stormwater runoff water quality management program. The development requires that the developer have high expertise in the field and be able to present a discussion of key issues in a issue paper on the topic. These are areas in which Dr. Lee has extensive experience and expertise. One of Dr. Lee's primary interests is working toward the incorporation of good science and engineering into formulation of public policy for water quality management. His extensive past and current publication productivity demonstrates his interest and effectiveness in developing technical materials that can be used to formulate technically valid, cost-effective public policy for environmental quality management.

Dr. Lee has extensive experience in developing programs of this type and as serving as a member on expert panels on major water quality management issues. Dr. Lee has a unique background in the sciences and engineering pertinent to the successful completion of this project. Also, his longstanding interest in formulating and implementing technically valid, cost-effective water pollution control programs provide him with the necessary expertise and experience to make a unique contribution to CALFED in formulating and implementing its urban and industrial stormwater runoff management program. Additional information regarding Dr. Lee's expertise and experience pertinent to this project is included in his web site (<http://members.aol.com/gfredlee/gfl.htm>).

Dr. Lee does not have a conflict of interest and will not accept consulting assignments that could be viewed as a conflict of interest before completion of this project and work with another client.

#### **Compliance with Standard Terms and Conditions**

Dr. Lee does not anticipate any problems complying with Terms and Conditions set forth in Attachment D to the RFP.